AU SPECIAL RETRAINING SESSIONS

There is an AU-only retraining session scheduled for Tuesday June 11, 2002 at 9:00 AM. AUs are encouraged to attend AU-only retraining sessions to interact with fellow AUs and discuss any issues of broad scope with the Radiation Safety Officer. Please join us and get your annual retraining completed.

POINT SYSTEM MODIFICATION

At its February 20, 2002 meeting, the Radiation Safety Committee approved a modification to the point system. The modification applies to disciplinary action that can be implemented by the Radiation Safety Committee if an authorized user accumulates 25 or more points during a semiannual period. Specifically, for the first instance where an authorized user has accumulated 25 or more points, but less than 75 points, the Radiation Safety Committee can issue a Radiation Safety Committee Advisory Notice. This Advisory Notice replaces the previously issued Notice of Reprimand. If an authorized user accumulates 25 or more points during two sequential semiannual periods or greater than 75 points during a single semiannual period, the Radiation Safety Committee shall continue to issue a Notice of Reprimand, when deemed appropriate. This modification was made to better emphasize the progressive disciplinary action system used by the Radiation Safety Committee.

The Radiation Safety Committee considered the above modification to be minor and instructed the Radiation Safety Office to not incorporate the change into the Authorized User's Manual at this time. The Radiation Safety Committee instructed the Radiation Safety Office to inform Authorized Users of the change via the Radiation Safety Office newsletter and to incorporate the change on the version of the Authorized User's Manual posted on the RSOf homepage. The Radiation Safety Committee voted to formally incorporate the change into the next major revision of the Authorized User's Manual.

SURVEY METER CALIBRATION

The RSOf performs all meter calibrations except for special meters that are beyond its capabilities. In these rare instances, the laboratory is responsible for arranging the calibration with an approved vendor. In addition, new or repaired meters that are calibrated by the vendor must be brought to the RSOf to be checked and entered into the RSOf tracking system.

All survey meters used for nonhuman-use area contamination and radiation surveys are required to be calibrated annually. Meters used in human-use areas are calibrated every six months. A meter's calibration does not expire until the end of the calibration due month written on the calibration sticker, e.g. sticker listed due date of June 15, 2002, must be turned in to the RSOf at least two working days before June 30, 2002. <u>Do not</u>

wait until the last two working days of the month to turn in a meter for calibration. If everyone procrastinates until the last day, the RSOf may not be able to calibrate all the meters before the end of the month. The RSOf goal is to calibrate each meter within two working days of receipt.

During the last week of each month, the RSOf sends notices to applicable AUs informing them they have meters due for calibration. If a meter has not been delivered for calibration by the last week of the calibration due month, a Radiation Safety Specialist will visit or call the AU to determine the status of the meter. The AU will receive an area-of-concern if a meter is not calibrated by the end of the due month. A notice of non-compliance will be issued if a meter is not calibrated by the 15th of the month following the calibration due month.

Before bringing your meter to the RSOf verify that it is working properly, the battery condition is good and that it is not contaminated. The RSOf does not provide batteries and cannot repair or calibrate a broken meter. The AU is responsible to send a broken survey meter out for repair.

After the meter is calibrated the RSOf notifies the AU that the meter is ready for pickup. Calibrated meters should be picked up within one week after notification. Follow-up phone calls are made if a survey meter is left in the RSOf for more than one week.

There are occasions where a laboratory cannot operate without their survey meter, e.g. it is the only meter in the laboratory. These laboratories have two options: 1) A loaner meter can be obtained from the RSOf to be used until the laboratory survey meter is calibrated and ready for pickup, or 2) The survey meter can be calibrated while you wait. The second option is not encouraged unless it is the only option. For the second option an appointment must be arranged with the RSOf staff member who will perform the calibration. This coordination of schedules could be difficult.

UNUSED DOSIMETERS

Another institution discovered an interesting problem concerning dosimeters (i.e. radiation monitoring badges) that the vendor reported as being “unused”. “Unused” on the dosimetry report indicates the dosimeter was returned to the vendor for analysis still in its plastic wrapper. These “unused” dosimeters are not analyzed.

An investigation at the institution revealed that at least one worker stated he found the dosimeter holder awkward to wear and was carrying the unopened dosimeter in his shirt pocket. He had been returning the dosimeter for analysis for several months; unfortunately, the dosimeters were not being analyzed and any dose he received was not documented.

Ensure dosimeters are always removed from their plastic wrappers and dosimeters are appropriately worn during periods of radiation exposure.

LIQUID SCINTILLATION USER SURVEY

In January of this year the RSOf initiated a survey designed to obtain a breakdown of the liquid scintillation, beta plate and mixed waste generated under the Radiation Control and Safety Program. The RSOf was informed of an inevitable price increase for processing liquid scintillation and beta plate waste by the RAM waste broker. The rationale of the survey was to form a strategy to minimize or eliminate any potential need to "pass on" overall cost increases to the Authorized Users.

Effective March 31, 2002 price increases initiated by processors were passed along to the RSOf by the LLRW waste broker. Under the new prices the costs for processing and disposing of liquid scintillation cocktail vials containing "biodegradable" (non-hazardous) cocktails is $450/55 gallon drum, while the cost for processing and disposal of liquid scintillation vials containing "hazardous" (i.e., flammable based on toluene and xylene) cocktails for radionuclides with half-lives greater than 109 days is $2350/55 gallon drum. The "hazardous" cocktail price is nearly ten times higher than the price before. The new price structure also makes it cost effective to segregate out beta plate waste because the costs have skyrocketed for beta plate waste as well.

Hazardous waste is a waste stream the RSOf wants to minimize. AUs can help this minimization by using only "biodegradable" scintillation cocktail. One incentive to use "biodegradable" scintillation cocktail is that it is considered safer for the user and less harmful to the environment than "hazardous" chemical based cocktail. The survey showed that the majority of AUs had already made the switch. Out of 224 respondents to the survey, only 25 AUs indicated they use "hazardous" chemical based scintillation cocktails.

Admittedly, segregation of hazardous from biodegradable waste is the best way to minimize costs and avoid any potential price hikes in the per-millicurie based waste fees. When changing liquid scintillation cocktails there are issues of cost, performance, and quench. If after assessing the pros and cons, an AU decides to stay with "hazardous" chemical based scintillation cocktail then, in accordance with Environmental Health and Safety requirements, the waste must also be appropriately labeled as "hazardous waste."

Information on the various types of scintillation media on the market are available at the following web sites:

Amersham Pharmacia Biotech, www.apbiotech.com
Fisher Scientific, www1.fishersci.com
ICN Biomedicals, www.icnpharm.com

National Diagnostics, www.nationaldiagnostics.com
Perkin-Elmer (NEN, Packard, Wallac),
shoplifesciences.perkinelmer.com
RPI, www.rpicorp.com

The University of Cincinnati has contracted reduced prices for the commonly used cocktails. It is recommended that Purchasing be contacted to determine if a selected cocktail can be purchased at less than catalog price.

THYROID MONITORING

The University of Cincinnati Radiation Safety office has a thyroid-monitoring program designed to monitor those individuals who may be potentially exposed to radioiodine (I-125, I-131). Its primary objective is to determine whether an uptake of radioiodine has occurred and, if so, what the thyroid burden is from I-125 or I-131. Radioiodine may be deposited internally by inhalation, ingestion, or absorption through the skin.

Radiation workers are responsible for knowing and adhering to the thyroid monitoring requirements as identified below:

Conditions Requiring Participation in the Thyroid Bioassay Program

1. Personnel preparing and/or administering I-131 dosages exceeding 30 mCi shall have a thyroid bioassay performed within 3 calendar days of the procedure.
2. Personnel using ≥ 2 mCi of I-125 and/or I-131 shall have a thyroid bioassay performed between 6 – 72 hours (within 3 working days). "Used" means in a procedure or opened vial.
3. Routine bioassays are required if a total of ≥ 1 mCi of unbound isotope is used on the bench per calendar quarter or a total of ≥ 10 mCi of unbound isotope is used in a hood per calendar quarter.

Activity Handled in Unsealed Form Making Bioassay Necessary*		
		Chemical Form
Types of Operations	Volatile or Dispersible*	Bound to Nonvolatile Agent*
Process in open room or on bench, with possible escape of iodine from process vessels	1 mCi	10 mCi
Process with possible escape of iodine carried out within a fume hood of adequate design, face velocity and performance reliability	10 mCi	100 mCi
Process carried out within glove boxes, ordinarily	100 mCi	1000 mCi

closed, but with possible escape of iodine from the process and occasional exposure to contaminated box and box leakage		

* Additional information:

a. Quantities may be considered the cumulative amount handled by a worker during a 3-month period (e.g., the total quantity introduced into a chemical or physical process over a 3 month period, or on one or more occasions in that period, by opening stock reagent containers from which radioiodine may escape.)

b. Quantities in the right hand column may be used when it can be shown that activity being used is always chemically bound and processed in such a manner that I-125 or I-131 will remain in nonvolatile form and diluted to concentrations less than 0.1 mCi/mg of nonvolatile. However, certain compounds where radioiodine is normally bound are known to release radioiodine when the material is processed, and the left hand column may then be applicable.

c. In those laboratories working only with I-125 in radioimmunoassay (RIA) kits, the quantities of I-125 are very small and in less volatile forms; thus, bioassay requirements may be judged from the right hand column.

d. In field operations, where reagent containers are opened outdoors for simple operations such as pouring liquid solutions, the above table does not apply. A bioassay should be performed whenever an individual employee handles, in open form (e.g., an open bottle or container) more than 50 uCi at any one time.

e. Operations involving the routine use of I-125 or I-131 in an open room should be discouraged.

f. Whenever practical, sealed bottles or containers holding more than 0.1 mCi of I-125 or I-131 should be opened at least initially within hoods having adequate face velocities of 0.5 m/sec (100 ft/min) or more.

DOSIMETRY MANAGEMENT ISSUES

The RSOf manages over 3,000 dosimeters on a continuing basis. Workers are activated and deactivated daily so even a small amount of confusion can cause a serious waste of valuable time. The intent of this article is to clarify the procedures for making additions, changes, and deletions to the status of workers using the RADIATION WORKER/DOSIMETRY APPLICATION Form 2.0.

The first point to be made is DO NOT ATTEMPT to make changes using the packing list or envelope that badges are delivered in, e.g. do not lineout names or print a name on the envelope or packing list and do not place a note in the envelope.

The Form 2.0 is used to add a radiation worker under one or more AUs and to determine what, if any, dosimetry is required and given to the worker. If dosimetry is required, it will be assigned to the primary AU's badge series (i.e. indicated by AU's signature on first line with ***) and the dosimeter will be charged to the primary AU.

Dosimetry requirements are determined using the expected sources of radiation exposure listed in Section 2 of the Form 2.0. For RAM users, the general dosimetry requirements are in the AU Manual Section 8.1. Dosimeters are required if working with beta emitters exceeding 250 keV, or gamma or x-ray emitters of any energy. If a radionuclide is listed that emits radiation in these categories, the worker will be issued a dosimeter; however, there is an exception. If a laboratory does not intend to use RAM in the near future and wants to minimize dosimetry costs, the AU should write on the front of the Form 2.0 the following statement or its equivalent, "No dosimetry needed at this time". When the laboratory is ready to obtain RAM, the workers should be sent to the RSOf to be issued temporary dosimeters and to have permanent dosimeters ordered.

The Form 2.0 is used to change the status of a radiation worker. An individual may want or have to work under the supervision of two or more AUs. To change a radiation worker's status a Form 2.0 is submitted with the additional AUs signing to add the worker. To change primary AUs, both AUs would sign indicating after their names which AU to add and which one to delete. The new primary AU needs to sign the first AU signature line (the one with ***) to indicate acceptance of primary AU status.

Deletions of radiation workers may be reported using a Form 2.0; however, there is another option. An email or memo can be sent to Debbie.Kirkpatrick@uc.edu listing specific individuals the AU wants removed as radiation workers. The deleted radiation workers are then moved to an inactive file and their dosimeters are cancelled.

A reminder on deadlines concerning dosimeters. All new dosimeters must be picked up in the RSOf by the end of the third workday of the month and old dosimeters must be returned to the RSOf by the tenth day of the month. Dosimeter additions or deletions will not take effect for the next month unless the changes are received in the RSOf before about the fourth day of the current month. This means that permanent dosimeters requested to be deleted on May 6 will still be delivered by Landauer in June and temporary dosimeters will have to be issued in June for all new dosimeter requests after May 4.

NON-COMPLIANCE FOR NOT PICKING UP DOSIMETERS

An AU recently received a non-compliance (and the Radiation Safety Committee associated points) for failing to pickup a dosimeter at the beginning of the month. He was not aware a dosimeter had been ordered when a new radiation worker submitted a Form 2.0 that listed ^{32}P as a radionuclide that would be used in the laboratory. RSOf staff ordered a permanent dosimeter based on this information. The AU did not become aware of the dosimeter until a non-compliance letter was sent informing him of the problem. If RAM requiring dosimetry is not to be used until a significant time in the future, make the entry (or its equivalent) "No dosimetry needed at this time" on the Form 2.0.

RAQs

This section gives answers to questions recently asked of the RSOf staff.

If I use greater than 200 uCi of RAM in an experiment, how soon do I need to do a survey? Do I keep doing weekly surveys if I use greater than 200 uCi once a month? A documented survey is required "during the week of use" anytime greater than 200 uCi of unsealed RAM is used. Undocumented surveys are required to be performed routinely while working with and after completion of work with RAM. The "weekly" documented survey should be performed soon after the last experiment using greater than 200 uCi is completed for the week. This documented survey should cover more areas than the routine survey performed after the completion of work. A documented "weekly" survey would only be required for the week that greater than 200 uCi is used each month. If procedures do not require routine weekly surveys it is recommended that all procedures involving greater than 200 uCi include a documented after use survey. This ensures the survey is performed in a timely manner and greater than 7 days does not pass before the individual remembers and performs the survey.

We don't get to see the quarterly newsletter. Are we required to read it? There is no regulatory requirement for anyone to read this newsletter; however, the articles presented each quarter usually relate to areas where problems or weaknesses have been recently observed in the Radiation Control and Safety Program. The paper copy of the newsletter should be accessible to all workers in the laboratory. If AUs do not discuss the newsletter at a staff meeting then it is recommended that the hard copy be routed through the AU's radiation workers. Note: The newsletters are also posted on the RSOf Web site.

RSOf ASSISTANCE

Authorized Users and/or their staff are encouraged to call the RSOf for assistance in any RCSP area of concern. The RSOf will

send personnel to consult with Authorized Users or their staff on solutions to problems or difficulties they are experiencing that may place the authorization in a non-compliant situation. It is important to note that no points will be assessed for non-compliances identified during a requested consultation visit.

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